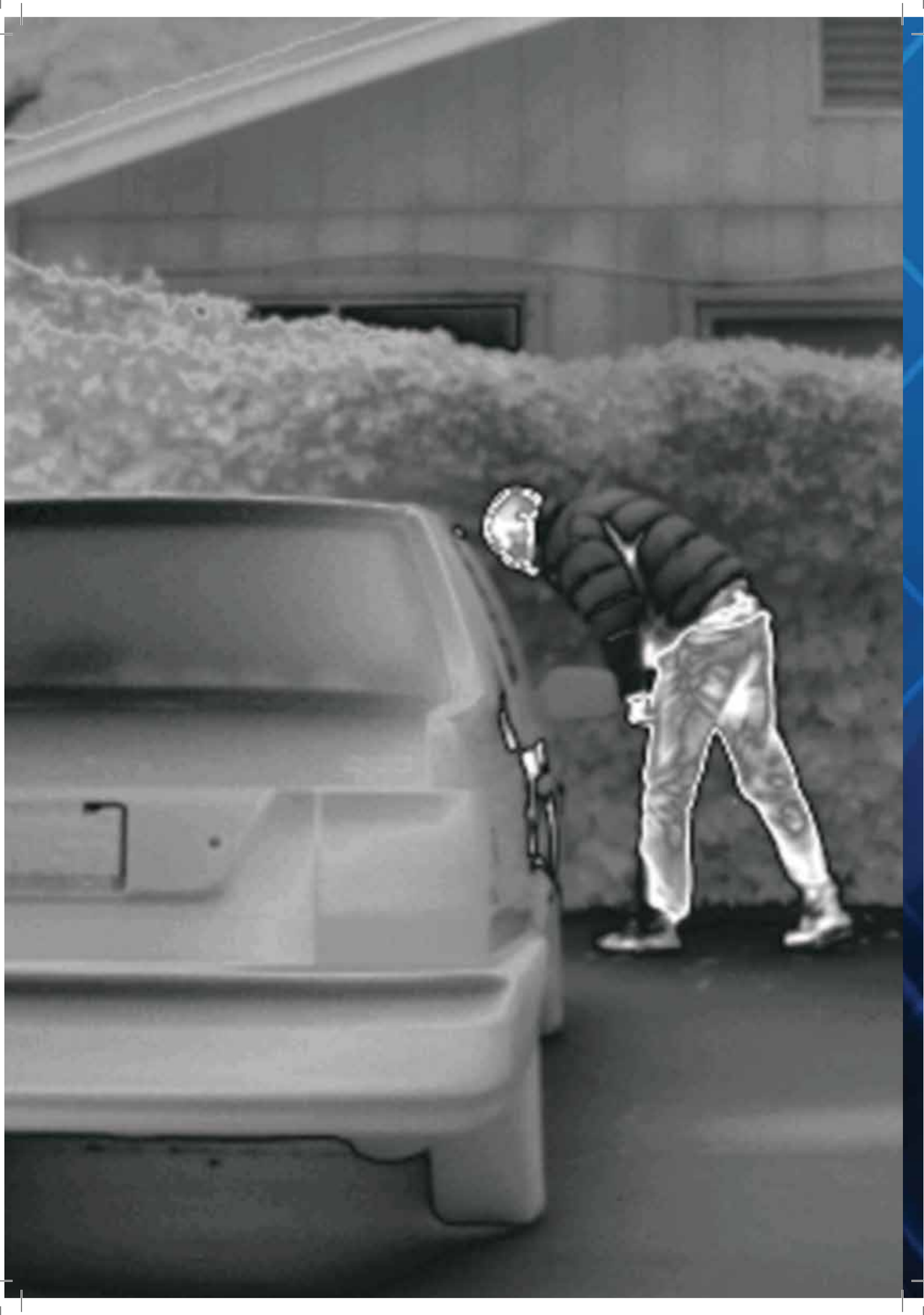
FLIR SYSTEMS

Thermal Security Cameras



FLIR Systems: the world leader for thermal imaging cameras

FLIR Systems is the world leader in the design, manufacturing and marketing of thermal imaging systems for a wide variety of commercial, industrial and government applications.

FLIR Systems' thermal imaging systems use state-of-the-art infrared imaging technology that detects infrared radiation - or heat - enabling the user to see in total darkness, in practically all weather conditions. We design and manufacture all of the critical technologies inside our products, including detectors, electronics, and special lenses ourselves.

FLIR Systems, Stockholm

FLIR Systems, Portland

FLIR Systems, Boston

FLIR Systems, Santa Barbara

Rapidly emerging markets and organization
Interest for thermal imaging has grown considerably over the last few years in a large variety of markets. To face this increased demand FLIR Systems expanded its organization drastically. Today we employ more than 1,900 people. Together, these infrared specialists realize a consolidated annual turnover of more than 1 billion US dollars. This makes FLIR Systems the largest manufacturer of commercial thermal imaging cameras in the world.

Manufacturing capabilities
FLIR Systems currently operates 5 manufacturing plants: three in the USA (Portland, Boston and Santa Barbara, California) one in Stockholm, Sweden and one in Paris, France.

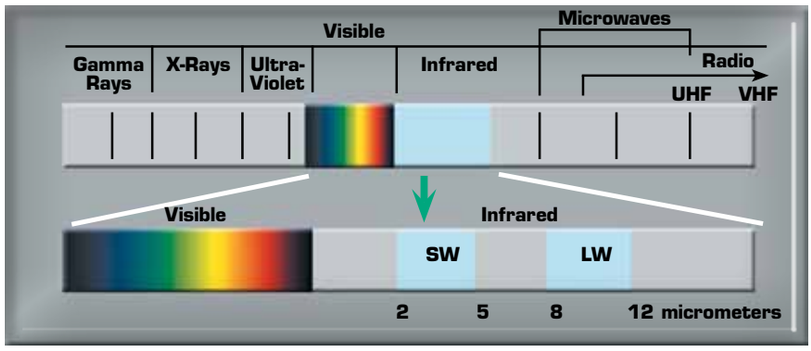
Thermal imaging: more than building a camera
There is more to the world of thermal imaging than building a camera. FLIR Systems is not only committed to providing you with the best camera, we are also able to offer you the best software, service and training to suit your thermal imaging needs.

INFRARED:
more than meets the eye

Infrared - part of the electromagnetic spectrum

Our eyes are detectors that are designed to detect visible light (or visible radiation). There are other forms of light (or radiation) that we cannot see. The human eye can only see a very small part of the electromagnetic spectrum. At one end of the spectrum we cannot see ultraviolet light, while at the other end our eyes cannot see infrared. Infrared radiation lies between the visible and microwave portions of the electromagnetic spectrum. The primary source of infrared radiation is heat or thermal radiation.

Any object that has a temperature above absolute zero (-273.15 degrees Celsius or 0 Kelvin) emits radiation in the infrared region. Even objects that we think of as being very cold, such as ice cubes, emit infrared radiation. We experience infrared radiation every day. The heat that we feel from sunlight, a fire or a radiator is all infrared. Although our eyes cannot see it, the nerves in our skin can feel it as heat. The warmer the object, the more infrared radiation it emits.

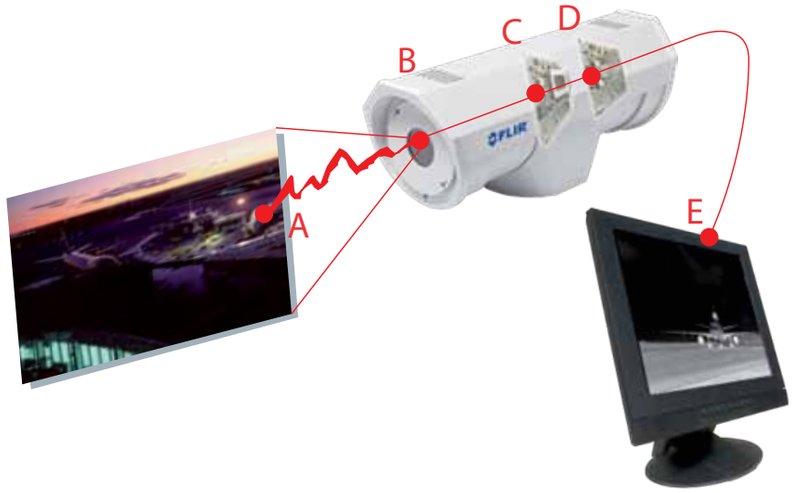


Thermal security cameras see heat

Thermal security cameras make pictures from heat energy that is invisible to the naked eye. Everything in the color image above is giving off heat – even the ice cubes she is holding in her left hand, and the circle she traced on the wall with her right hand.

The thermal imaging camera

Infrared energy (A) coming from an object is focused by the optics (B) onto an infrared detector (C). The detector sends the information to sensor electronics (D) for image processing. The electronics translate the data coming from the detector into an image (E) that can be viewed on a standard video monitor or LCD screen, or anywhere on a network-enabled computer.



THERMAL IMAGING CAMERAS:
perfect tools for a remote surveillance network

Thermal imaging cameras produce a crisp image in the darkest of nights. Contrary to other technologies, thermal imaging cameras need no light whatsoever to produce a crisp image. They can see through light fog and smoke, in practically all weather conditions. This makes them the perfect tools for remote surveillance 24/7.

Thermal imaging can be used for all types of remote security & surveillance applications. Definitely the ones that need to be able to detect potential intruders in total darkness. In all weather conditions. Which they practically all do. After all, security is all about letting no threats go undetected. 24 hours per day.

FLIR Systems thermal imaging cameras are being used worldwide to secure houses, estates, warehouses, nuclear facilities, ports, airports, (petro) chemical installations, pipelines, land and sea borders, …

They are also being used for indoor applications. When the lights go out or a fire breaks out, people still want to see what is happening inside. Thermal imaging can also see through smoke so it can help to guide fire-fighters in case of a fire.

Thermal imaging cameras are also extremely useful during daylight. Thermal contrast is extremely difficult to mask. Someone trying to hide in shadows or bushes and people that are trying to camouflage themselves, will become clearly visible on a thermal image. Thermal imaging cameras are also not blinded by the glare from the sun. They produce a crisp image in practically all weather conditions.

THERMAL IMAGING CAMERAS:
a wide variety of applications

See in total darkness

Thermal image

Because everything generates heat, thermal security cameras can see as well at night as they can during the day. Cameras dependent on visible light are useless at night or in poor visibility without supplementary illumination from lights or lasers.

Normal vision

THERMAL IMAGING CAMERAS:
a wide variety of applications

Complement your visible-light camera network

Low-cost infrared illuminated cameras rely on shortwave IR lamps to illuminate threats, resulting in shadows, reflections, backscatter, higher power consumption, narrow areas of illumination, and much shorter ranges than passive thermal camera technology.

See through obscurants

Thermal energy passes through many obscurants including smoke, dust, modest foliage and light fog. The thermal camera can see this person clearly through the fog, but the standard visible light color camera cannot.

Maximize detection

In most cases, thermal energy travels through the atmosphere more effectively than visible light. As a result, thermal imagers can see activity at extreme ranges, while visible cameras, which rely on color contrast, fail.

Applications that require more information than the eye can see

Thermal imaging can provide information about a scene that isn't always visible to the naked eye, like open windows, or recently parked vehicles. Enhancing your situational awareness in this way can prove vital to ensuring your facility's security.

Port security

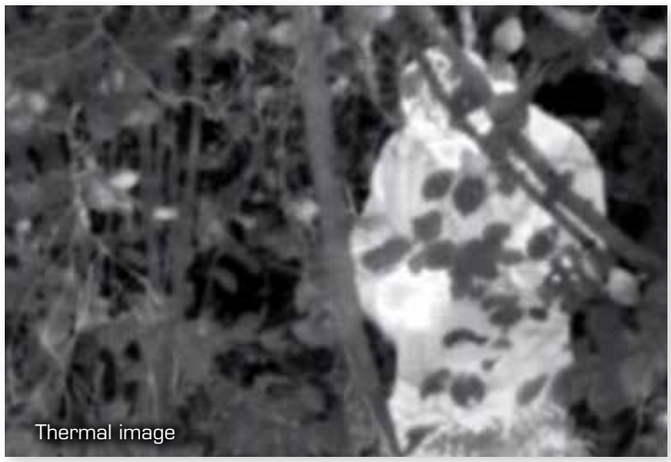
In most cases, it is impossible to adequately light waterways, waterfronts, and wetlands. Thermal security cameras provide excellent visibility at long ranges without lighting or other artificial illumination.

Situations where lighting is unwelcome

In situations where lighting can disturb local residents, or where it might draw unwanted attention to your facility, thermal security cameras allow for covert operation.

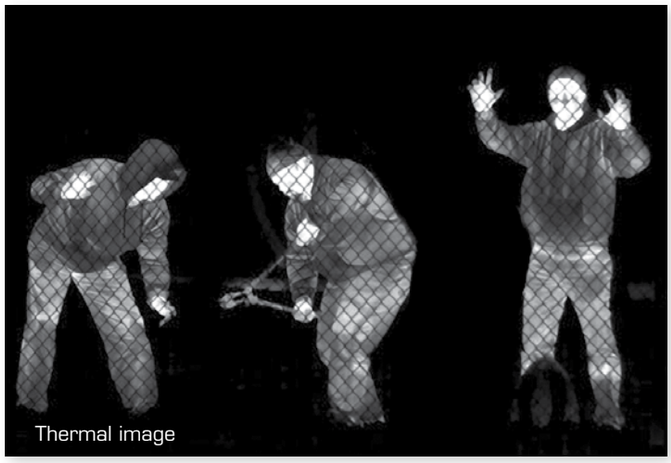
THERMAL IMAGING CAMERAS:
a wide variety of applications

Perimeter intrusion or areas too large to illuminate



Border applications, power generation facilities, refineries, and airports have perimeters that can encompass miles of real estate. Thermal security cameras provide an effective, economical solution for securing these vital areas, day and night.

Critical infrastructure



Thermal security cameras provide the high levels of threat detection capability critical for nuclear power plant security, where there is no margin for error. Lighting complications and extreme detection range needs are challenges thermal security cameras meet with ease.

See more during the day

Conventional TV cameras rely on color contrast to provide enough information for the viewer to detect a threat. Even at moderate ranges, weak contrast can render these cameras useless. Thermal cameras do not have this limitation.

Thermal energy travels through many atmospheric obscurants better than visible light. Through smoke, dust, even light fog, thermal security cameras are ideal for detecting activity at extremely long ranges.

FLIR Systems:
A full range of thermal surveillance cameras

FLIR Systems markets a full range of thermal imaging cameras for every security application. Some systems can detect a human target at a distance of 100 meters, others can spot a man-sized target at several kilometers away. In total darkness. No other technology offers this type of range performance.

Some models are fixed mount. To increase situational awareness even further, Pan/Tilt versions are also available.

FLIR Systems also markets Multi-sensor Systems. These combine one or two thermal imaging cameras with a daylight/lowlight camera that can be used when conditions permit.

No matter how small or how big the perimeter is, FLIR Systems has a suitable thermal imaging camera for every security and surveillance application.

SR-Series

F-Series

PT-Series

D-Series

PTZ-35x140 MS

FLIR APPLICATION EXAMPLES

FLIR thermal imaging cameras are used for a wide variety of security and surveillance applications. Ports, airports, warehouses, (petro)chemical installations, and many others, they can all benefit from the power of thermal imaging cameras. Following are just a few examples of how our customers are using FLIR thermal imaging cameras for perimeter protection.

If you would like to know more about any of these applications or if you would like to read about other applications for thermal imaging, please ask for our full application leaflets.

Abertura Solar Powerplant - Spain

29 FLIR thermal imaging cameras work together with FLIR Sensors Manager and create a virtual fence around the perimeter.

Abertura Photovoltaic Solar Plant spans a surface of over 200 hectares. More than 132,000 solar panels on 2,112 solar trackers with a total power installed of 23.1 Mega Watt peak.

FLIR Systems SR-Series thermal imaging camera, a sound and light beacon and a CCTV dome installed at an observation point.

ORLEN refinery - Poland

FLIR Thermal imaging cameras work together with video analytics to protect the perimeter at one of the largest refineries in Europe.

Polski Koncern Naftowy ORLEN, better known as PKN ORLEN is a Polish company. It is one of Central Europe's largest refiners of crude oil. ORLEN specializes in processing crude oil into world-class unleaded petrol, diesel, heating oil, and aviation fuel as well as plastics and other petroleum related products.

FLIR Systems SR-Series installed at Orlen.

Security at Munich Airport - Germany

FLIR thermal imaging cameras make sure that the airport's perimeter is protected 24/7.

Munich Airport, is the 7th largest in Europe. Keeping intruders outside the perimeter is, like on any airport, of the utmost importance.

The FLIR Systems SR-Series is mounted on a pan/tilt together with a CCTV camera.

Oubaai Golf Estate - South Africa

Thermal imaging helps to keep unwanted intruders out of the resort. Six FLIR thermal imaging cameras have been installed among which is a PTZ-35x140 MS.

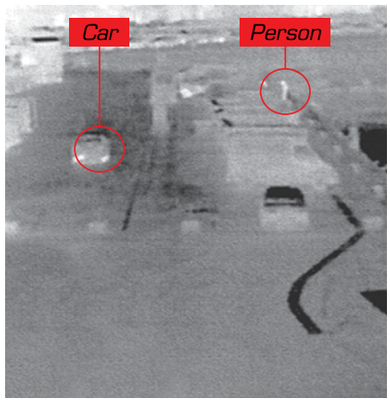
Oubaai Golf Estate, in the heart of the famous South African Garden Route.

The FLIR Systems PTZ-35x140 MS. It contains 2 thermal imaging cameras and one daylight/lowlight camera.

Port of Calais - France

FLIR thermal imaging cameras help to prevent illegal immigration to the UK and help the Port of Calais to comply with International Ship and Port Facility Security (ISPS) regulations.

Situated on the most frequented shipping lanes in the world, Calais is the port, par excellence, for cross Channel links between the United Kingdom and the European mainland.



Thermal image taken by one of the FLIR Systems SR-Series thermal imaging cameras. Cars and people can clearly be detected, in total darkness.

THERMAL IMAGING CAMERAS:

a cost effective solution for perimeter protection

Today, the challenge to CCTV professionals is to make sure that video footage is effective on a 24/7 basis, 365 days a year. Securing an area during the daytime is one thing. But what happens during the night? And in weather conditions like fog, rain and snow? What can be detected if CCTV cameras are blinded by the sun?

Whatever solution or technology is chosen for securing an area, they all have their advantages and disadvantages and some technologies are more expensive than others. To get a full picture of the Total Cost of Ownership (TCO) for a certain solution, not only the initial installation cost but also the maintenance cost needs to be taken into account.

Quite a number of technologies are available to help detect potential intruders in the dark. Let´s compare some of them:

Closed-circuit television (CCTV) combined with traditional lighting

CCTV systems have been an effective tool for security and surveillance applications. However CCTV cameras do not see too much in total darkness. So in order to detect intruders at night they are often complemented with traditional lights by mains driven bulbs. Although some bulbs (fluorescent lamps, HID lamps) are more efficient than others the operational cost is very high. Light can only penetrate a certain distance and completely illuminating an area, so that it can be kept under surveillance of CCTV cameras, is not always possible. Powering and maintaining the lights can even be more costly. Furthermore, lighting essentially lays out a route of attack for intruders, creating shadows in which they can hide and access undetected.

Closed-circuit television (CCTV) combined with LED's

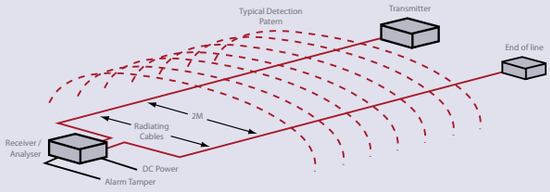
Compared to any bulb, LED's provide significant savings on electrical consumption. LED's also provide long life performance with little ongoing maintenance. Infrared illumination with LED's, sometime also called active infrared, beams infrared radiation into the area in front of a camera. The LED's are often placed around the lens of the camera.
LED illumination is compromised by limited range performance. Also, providing lighting for domes has long been a challenge for CCTV professionals as the lighting cannot be fitted to move with the camera.

Electrified fences

In order to keep intruders out of certain areas fences can be constructed. To further increase security, fences can be equipped with sensors that generate an automatic alarm when someone touches the fence. Or they can be electrified, to keep intruders away.
In all cases, fences need to be complemented by other technologies such as CCTV cameras or walking patrols in order to see what is happening around the fence.

Radio Frequency Intruder detection (RAFID)

The simplest description of RAFID is to consider a system using two specially designed cables – one transmitting a radio wave, while the other receives that wave.



Changes in the amount of signal passing between the transmitter cable and receiver cable are analyzed by a signal processor. If the amount of signal changes, this means that someone or something is between the two cables and an alarm will go off. Due to the difference in the signal strength, the system can detect whether these changes are due to the presence of a human, a small animal, …

Note that in a lot of cases CCTV cameras still need to be installed in order to see what is generating a real, or false, alarm.

Thermal imaging

An excellent tool for seeing in total darkness, in the most diverse weather conditions is thermal imaging.

Most FLIR Systems thermal imaging cameras contain an uncooled Vanadium Oxide detector. The detector not only produces excellent quality thermal images, since it is not containing any moving parts, it needs no maintenance. Thermal imaging technology requires no additional lighting or illumination and has no regular maintenance costs.

Deciding which technology to use

Security managers are more familiar with certain technologies than with others. Before making a final decision about which technology will be implemented to secure a perimeter at night, it is a good idea to have a look at the advantages and disadvantages of each technology. This table tries to summarize the different technologies and their advantages / disadvantages.

	Advantages	Disadvantages
CCTV with traditional lighting or LED	- Good visibility during daytime - Relatively low initial cost	- A lot of cameras need to be installed to cover a large perimeter - Limited detection at night. Light illuminates only certain small area. - Limited capabilities in fog, rain, … - Civil works need to be carried out to install light poles - High power consumption - High maintenance cost for replacing the lights: material and manpower
Electrified Fence	- Creates a physical barrier - Allows to stop intruders - Works during the night as well	- High installation cost - Full civil works needed - Power consumption - Needs to be complemented with CCTV to see if alarm is false or not. - Light or infrared illumination needed during the night to do this.
RAFID or Sensor Cable	- Fully automated system - Works in total darkness	- High installation cost - Full civil works needed - Troubleshooting and maintenance after installation - Many false alarms - Needs to be complemented with CCTV to see if alarm is false or not. - Light or infrared illumination needed during the night to do this.
Thermal imaging	- Full awareness - Can be used day and night - Works in practically all weather conditions. - Can see through light fog, rain, smoke, ... - No downtime, low maintenance - Low power consumption - Extremely difficult to hide from since thermal contrast in practically impossible to mask	- No physical barrier - Potential intruders are easily spotted but not identified

Conclusion

All technologies have advantages and disadvantages but thermal imaging is a very good and a very cost effective solution for protecting a perimeter. This is definitely true if the perimeter needs to be protected during the night.

Although a thermal imaging camera is a bit more expensive than a CCTV camera, less cameras need to be deployed to cover the same area. The civil works that need to be carried out are minimal. Furthermore, since thermal imaging cameras produce a clear image in the darkest of nights, no complimentary technologies like light or infrared illuminators need to be installed. This limits the amount of civil works that needs to be carried out but is it also reducing the maintenance cost.

Thermal imaging cameras also generate fewer false alarms which is a common problem with CCTV cameras combined with Video Motion Detection or Video Content Analysis softwares.

Although thermal imaging cameras are a bit more expensive than CCTV cameras at initial purchase, they are often not only the best, but also the most cost effective solution.

SR-SERIES

Extremely affordable, analog thermal security cameras with excellent range performance

The SR-Series feature the same thermal imaging technology found in many of FLIR's most sophisticated security and surveillance systems, but are packaged for users who have mid-range security and surveillance as their primary application. The SR-Series are excellent tools to install in new or existing security installations. They just need power and connection to a screen.

640 x 480

320 x 240

or

160 x 120

Crisp thermal images – choice of image quality
The SR-Series are using the most advanced thermal imaging technology available on the market today. They incorporate an uncooled Vanadium Oxide microbolometer detector producing crisp 640 x 480 pixels thermal images. Users that do not require this high image quality can choose for a 320 x 240 or 160 x 120 detector.

More pixels allow the user to see more detail and to detect more and smaller objects. Advanced internal camera software delivers a crisp image without the need for user adjustments. It provides high quality thermal imaging in any night- or daytime environmental conditions.

4°

Excellent range performance
Equipped with a 100 mm lens, the SR-Series is designed for mid-range security and surveillance applications. The SR-304 has a 4° field of view. With the SR-304 you will be able to detect a man-sized target at a distance of over 2 km.

Digital Detail Enhancement
The SR-Series provide high contrast imagery optimized to get the most out of video analytics software. Digital Detail Enhancement ensures clear, properly contrasted thermal images in all weather conditions.

Easy to use
Equipped with an "athermal lens", all SR-Series are able to maintain focus no matter what the environmental temperature is. There is no need for user adjustments.

No maintenance needed
The absence of a motorized focus mechanism prevents mechanical break downs. The SR-Series do not need any maintenance whatsoever. This guarantees an extremely low total cost of ownership.

Easy-to-install
All SR-Series can be easily connected to common power and video interfaces found in existing and new security systems. They can be easily integrated into any existing CCTV infrastructure providing early detection and visibility 24/7 all the year round. The images from the 640 x 480 or 320 x 240 pixels detector can be displayed on virtually any existing display that accepts composite video.

IP66

Designed for use in harsh environments
The SR-Series are extremely rugged systems. Their vital core is well protected, meeting IP66 requirements, against dust and water ingress.

Serial control interface
For easy integration in analog video environments. Serial control and analog composite video output enable ready integration into legacy network designs.

Extremely affordable
The SR-Series come at an extremely affordable price. From now on, price is no longer an object to integrate thermal imaging into your new or existing video security networks.

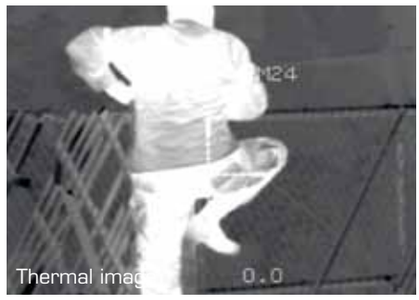
All SR-series thermal imaging cameras can be easily installed and integrated in existing CCTV networks

SR-348 *SR-313* *SR-304*

Different lens options available

The following table gives an overview of the available SR-Series versions

	Available lens options
160 x 120 pixels	SR-124: 9 mm lens – FOV: 24°(H) x 20°(V)
	SR-117: 13 mm lens – FOV: 17°(H) x 14°(V)
	SR-112: 19 mm lens – FOV: 12°(H) x 10°(V)
320 x 240 pixels	SR-348: 9 mm lens – FOV: 48°(H) x 39°(V)
	SR-334: 13 mm lens – FOV: 34°(H) x 28°(V)
	SR-324: 19 mm lens – FOV: 24°(H) x 19°(V)
	SR-313: 35 mm lens – FOV: 13°(H) x 10°(V)
	SR-309: 50 mm lens – FOV: 9°(H) x 7°(V)
	SR-304: 100 mm lens – FOV: 4.6°(H) x 3.7°(V)
640 x 480 pixels	SR-645: 13mm lens – FOV: 45°(H) x 37°(V)
	SR-625: 25mm lens – FOV: 25°(H) x 20°(V)
	SR-618: 35mm lens – FOV: 18°(H) x 14°(V)
	SR-612: 50mm lens – FOV: 12°(H) x 10°(V)
	SR-606: 100mm lens – FOV: 6.2°(H) x 5°(V)



F-SERIES

Network-Ready Fixed mount Cameras

F-Series thermal security cameras let you see intruders and other threats to your facility clearly in total darkness and in bad weather. Fully enabled for control and operation over digital and analog networks, F-Series thermal imaging cameras are available in 160 x 120, 320 x 240, and high-resolution 640 x 480 formats, providing up to sixteen times the image clarity and longer threat detection range performance than lower resolution cameras.

640 x 480
or
320 x 240
or
160 x 120

Crisp thermal images – choice of image quality
The user can choose for a version equipped with an uncooled Vanadium Oxide (VOx) microbolometer producing crisp images of 640 x 480 pixels. Users that do not need this image quality can choose for a 320 x 240 pixels version. Models with a 160 x 120 pixels detector are also available.

More pixels allow the user to see more detail and to detect more and smaller objects. Advanced internal camera software delivers a crisp image without the need for user adjustments. It provides high quality thermal imaging in any night- or daytime environmental conditions.

Digital Detail Enhancement
The F-Series provide high contrast imagery optimized to get the most out of video analytics software. Digital Detail Enhancement ensures clear, properly contrasted thermal images in all weather conditions.

4°

Excellent range performance
Equipped with a 100 mm lens, the F-304 is designed for mid-range security and surveillance applications. The F-304 has a 4° field of view. With the F-304 you will be able to detect a man-sized target at a distance of over 2 km.

Easy to use
Equipped with an “athermal lens”, all F-Series are able to maintain focus no matter what the environmental temperature is. There is no need for user adjustments.

IP66

Designed for use in harsh environments
The F-Series are extremely rugged systems. Their vital core is well protected, meeting IP66 requirements, against dust and water ingress.

No maintenance needed
The absence of a motorized focus mechanism prevents mechanical break downs. The F-Series do not need any maintenance whatsoever. This guarantees an extremely low total cost of ownership.

Exchangeable camera cassettes
Exchangeable camera cassettes allow for quick upgrade or repair of sensors and optics. There is no need to send your camera back to the factory if you want to upgrade to better image quality or more range performance. This can easily be done in the field.

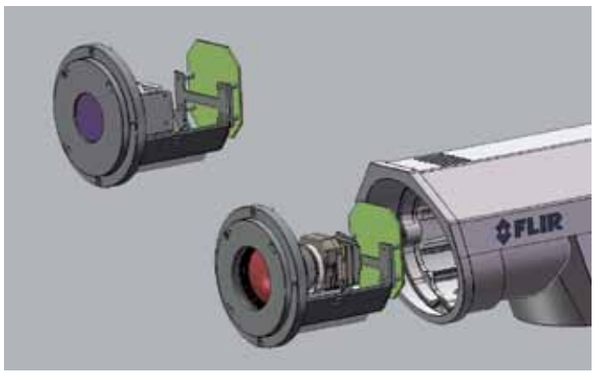
IP CONTROL

IP control
The F-Series can be integrated in any existing TCP/IP network and controlled over a PC. No additional cables are required. Using this configuration, you can monitor all activity over the network, even when you are thousands of kilometers away.

Serial control interface
Simply connect the F-Series over RS-232, RS-422 or RS-485 to a remote control panel. Pelco D or Bosch commands are used for common functions. A video cable can be connected to any existing multi-function display that accepts composite video.

Video Streaming
Multiple channels of streaming digital video are available in H.264, MPEG-4, or M-JPEG formats. Simultaneous digital and composite video output is possible.

FLIR Sensors Manager
Each F-Series camera comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control an F-Series camera in a TCP/IP network.

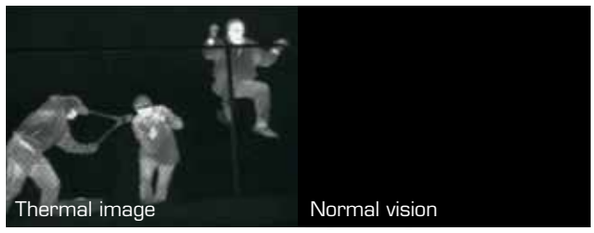


Thanks to an "exchangeable cassette" system, the F-Series are field upgradeable. Whether you want to upgrade your existing F-Series to better image quality or if you want more range performance, there is no need to send the camera back to the factory.

Different lens options available

The following table gives an overview of the available F-Series versions

	Available lens options
160 x 120 pixels	F-124: 9 mm lens – FOV: 24°(H) x 20°(V)
	F-117: 13 mm lens – FOV: 17°(H) x 14°(V)
	F-112: 19 mm lens – FOV: 12°(H) x 10°(V)
320 x 240 pixels	F-348: 9 mm lens – FOV: 48°(H) x 39°(V)
	F-334: 13 mm lens – FOV: 34°(H) x 28°(V)
	F-324: 19 mm lens – FOV: 24°(H) x 19°(V)
	F-313: 35 mm lens – FOV: 13°(H) x 10°(V)
	F-307: 65 mm lens – FOV: 7°(H) x 5°(V)
	F-304: 100 mm lens – FOV: 4.6°(H) x 3.7°(V)
640 x 480 pixels	F-645: 13 mm lens – FOV: 45°(H) x 37° (V)
	F-625: 25 mm lens – FOV: 25° (H) x 20°(V)
	F-618: 35mm lens – FOV: 18° (H) x 14°(V)
	F-612: 50mm lens – FOV: 12°(H) x 10°(V)
	F-606: 100mm lens – FOV: 6.2°(H) x 5° (V)



PT-SERIES

Network-Ready Pan-Tilt, Multi-Sensor Thermal Security Cameras

PT-Series thermal security cameras let you see intruders and other threats to your facility's security clearly in total darkness and in bad weather. The PT-Series precision pan/tilt mechanism gives operators accurate pointing control while providing fully programmable scan patterns, radar slew-to-cue, and slew-to-alarm functionality. Fully enabled for control and operation over digital and serial networks, PT-Series thermal cameras are available in 160 x 120, 320 x 240, and high-resolution 640 x 480 formats, providing up to sixteen times the image clarity and longer threat detection range performance than lower resolution thermal cameras. Multi-sensor configurations also include a day/night 36x zoom color CCD camera on the same pan/tilt package.

640 x 480

or

320 x 240

or

160 x 120

Crisp thermal images – choice of image quality
The user can choose for a version equipped with an uncooled Vanadium Oxide (VOx) microbolometer producing crisp images of 640 x 480 pixels. Users that do not need this image quality can choose for a 320 x 240 pixels version. Models with a 160 x 120 pixels detector are also available.

More pixels allow the user to see more detail and to detect more and smaller objects. Advanced internal camera software delivers a crisp image without the need for user adjustments. It provides high quality thermal imaging in any night- or daytime environmental conditions.

Precise Pan/Tilt mechanism
All PT-Series thermal imaging cameras are installed on a precision pan/tilt mechanism. It allows the user to rotate the camera 360° continuously and to tilt it +90° or -90°. This drastically increases situational awareness. The Pan/Tilt has 128 preset postions. Ideal if you want to scan an area continuously.

Radar Connection – "Slew to cue"
The PT-Series can be connected by the integrator to a radar system. If the radar detects an object, the PT-Series will automatically turn in the right direction and give you a visual image so that you can instantly see what the blip on the radar screen really means.

Daylight camera
All versions are equipped with a long range daylight/low light camera. The video output of the thermal imaging and daylight/low light camera are simultaneously available. The daylight camera offers an 36x optical zoom.

Digital Detail Enhancement
The PT-Series provide high contrast imagery optimized to get the most out of video analytics software. Digital Detail Enhancement ensures clear, properly contrasted thermal images in all weather conditions.

4°

Excellent range performance
Equipped with a 100 mm lens, the PT-304 is designed for mid-range security and surveillance applications. The PT-304 has a 4° field of view. With the PT-304 you will be able to detect a man-sized target at a distance of over 2 km.

Easy to use
Equipped with an "athermal lens", all PT-Series are able to maintain focus no matter what the environmental temperature is. There is no need for user adjustments.

IP66

Designed for use in harsh environments
The PT-Series are extremely rugged systems. Their vital core is well protected, IP66 requirements, against dust and water ingress.

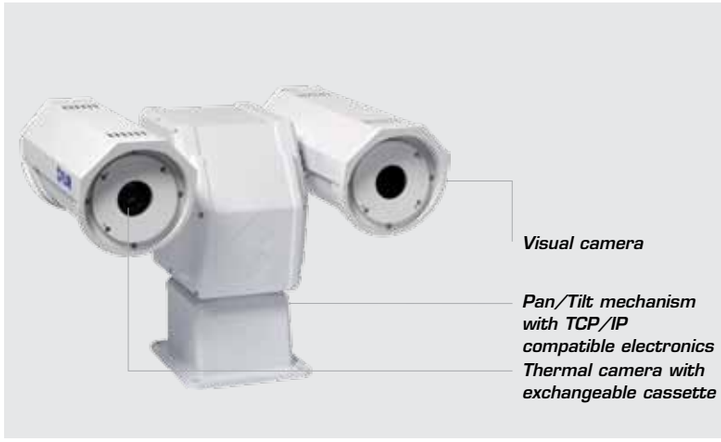
Exchangeable camera cassettes
Exchangeable camera cassettes allow for quick upgrade or repair of sensors and optics. There is no need to send your camera back to the factory if you want to upgrade to better image quality or more range performance. This can easily be done in the field.

IP control
The PT-Series can be integrated in any existing TCP/IP network and controlled over a PC. No additional cables are required. Using this configuration, you can monitor all activity over the network, even when you are thousands of kilometers away.

Serial control interface
Simply connect the PT-Series over RS-232, RS-422 or RS-485 to a remote control panel. Pelco D or Bosch commands are used for common functions. A video cable can be connected to any existing multi-function display that accepts composite video.

Video Streaming
Multiple channels of streaming digital video are available in H.264, MPEG-4, or M-JPEG formats. Simultaneous digital and composite video output is possible.

FLIR Sensors Manager
Each PT-Series camera comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control a PT-Series camera in a TCP/IP network.



Different lens options available

The following table gives an overview of the available PT-Series versions

	Available lens options
160 x 120 pixels	PT-124: 9 mm lens – FOV: 24°(H) x 20°(V)
	PT-117: 13 mm lens – FOV: 17°(H) x 14°(V)
	PT-112: 19 mm lens – FOV: 12°(H) x 10°(V)
320 x 240 pixels	PT-348: 9 mm lens – FOV: 48°(H) x 39°(V)
	PT-334: 13 mm lens – FOV: 34°(H) x 28°(V)
	PT-324: 19 mm lens – FOV: 24°(H) x 19°(V)
	PT-313: 35 mm lens – FOV: 13°(H) x 10°(V)
	PT-307: 65 mm lens – FOV: 7°(H) x 5°(V)
	PT-304: 100 mm lens – FOV: 4.6°(H) x 3.7°(V)
640 x 480 pixels	PT-645: 13 mm lens – FOV: 45°(H) x 37°(V)
	PT-625: 25 mm lens – FOV: 25°(H) x 20°(V)
	PT-618: 35mm lens – FOV: 18°(H) x 14°(V)
	PT-615: 50mm lens – FOV: 12°(H) x 10°(V)
	PT-606: 100mm lens – FOV: 6.2°(H) x 5°(V)

D-SERIES

Multi-Sensor Thermal Security Cameras In Networked, Outdoor Dome Enclosures

The D-Series outdoor dome enclosure provides precision pan/tilt control while providing fully programmable scan patterns, radar slew-to-cue, and slew-to-alarm functionality. Fully enabled for control and operation over IP and serial networks, D-Series systems deploy a 320 x 240 thermal imager along with a day/night 36x zoom color CCD camera. FLIR's D-Series thermal multi-sensor security dome cameras are the perfect replacement for day/night dome cameras, providing clear 24/7 imaging capability in an attractive, discrete dome-style enclosure.

Crisp thermal images
All versions of the outdoor domes are equipped with an uncooled Vanadium Oxide microbolometer detector that produces crisp images of 320 x 240 pixels.

Precise Pan/Tilt mechanism
All D-Series thermal imaging cameras come with a precision pan/tilt mechanism. It allows the user to rotate the camera 360° continuously and to tilt it +45° to -180°. This drastically increases situational awareness. The Pan/Tilt has 128 preset positions. Ideal if you want to scan an area continuously.

Daylight camera
All versions are equipped with a long range daylight/low light camera. The daylight camera offers an 36x optical zoom.

Digital Detail Enhancement
The D-Series provide high contrast imagery optimized to get the most out of video analytics software. Digital Detail Enhancement ensures clear, properly contrasted thermal images in all weather conditions.

Excellent range performance
Equipped with a 35 mm lens, the D-313 is designed for mid-range security and surveillance applications. The D-313 has a 13° field of view. With the D-313 you will be able to detect a man-sized target at a distance of over 780 meters.

Easy to use
Equipped with an "athermal lens", all D-Series are able to maintain focus no matter what the environmental temperature is. There is no need for user adjustments.

Designed for use in harsh environments
The D-Series are extremely rugged systems. Their vital core is well protected, IP66 requirements, against dust and water ingress.

IP control
The D-Series can be integrated in any existing TCP/IP network and controlled over a PC. No additional cables are required. Using this configuration, you can monitor all activity over the network, even when you are thousands of kilometers away.

Serial control interface
Simply connect the D-Series over RS-232, RS-422 or RS-485 to a remote control panel. Pelco D or Bosch commands are used for common functions. A video cable can be connected to any existing multi-function display that accepts composite video.

Video Streaming
Multiple channels of streaming digital video are available in H.264, MPEG-4, or M-JPEG formats. Simultaneous digital and composite video output is possible.

FLIR Sensors Manager
Each D-Series camera comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control a D-Series camera in a TCP/IP network.

D-Series Outdoor Domes: different lens options available

The following table gives an overview of the available D-Series versions

	Available lens options
320 x 240 pixels	D-348: 9 mm lens – FOV: 48°(H) x 39°(V)
	D-334: 13 mm lens – FOV: 34°(H) x 28°(V)
	D-324: 19 mm lens – FOV: 24°(H) x 19°(V)
	D-313: 35 mm lens – FOV: 13°(H) x 10°(V)

Indoor Domes

FLIR Systems also offers indoor domes. When the lights go out inside a facility or when a fire breaks out, you still need to be able to see. Thermal imaging cameras can see in total darkness and through smoke.

Normal vision *Thermal image*

Normal vision *Thermal image*

Choice of systems

The D-6 is equipped with a 6.3 mm wide angle lens. It gives you an extremely wide field of view (52°) so that you can cover a large area. The D-6 produces crisp images of 160 x 120 pixels.

Users that want to see farther can choose for the D-19. It is equipped with a 19 mm lens which gives it more range performance. Furthermore, it produces ultra-sharp images of 320 x 240 pixels on which the smallest of details can be seen.

Pan/Tilt

The D-series can continuously rotate 360° horizontally and tilt 0° to 90°, allowing the operator to look wherever he wants. Up to 32 different positions can be preset so that by a push on a button, the camera turns in the desired direction. The D-series allows the user to record a defined pattern existing of up to 200 instructions. The system can be commanded to 'replay' the path of motion. Setting up a scanning path between 2 user defined points is also possible.

PTZ-35x140 MS / SR-35X140 MS

Multi-Sensor Systems combining 2 thermal imaging cameras and a daylight camera

The PTZ-35x140 MS and SR-35x140 MS are especially developed for security applications. They are powerful, multi-sensor, mid-range, thermal imaging systems. They feature two thermal imaging cameras and one daylight / low light camera. One thermal imager has a wide angle field-of-view and is ideal for situational awareness. The other with the narrow field-of-view is designed for mid-range target recognition.

Crisp thermal images - 320 x 240 pixels
Both the PTZ-35x140 MS and SR-35x140 MS are equipped with an uncooled Vanadium Oxide microbolometer detector that produces crisp images of 320 x 240 pixels.

Two thermal imaging cameras
Both systems are equipped with two separate thermal imaging cameras. One has a 35 mm wide angle lens, the other has a 140 mm narrow field of view lens.

Integrated long range daylight / low light camera with continuous zoom
With the touch of a button you can switch between the thermal camera and the daylight / low light camera. It provides you additional information and identification when conditions permit. The daylight camera has an up to 26 times optical zoom. Displaying both the thermal image and the daylight image at the same time is also possible via Ethernet.

Designed for use in harsh environments
The PTZ-35x140 MS and SR-35x140 MS are extremely rugged systems. The cameras are well protected, IP66 rated, against dust and water ingress. The corrosion resistant housing ensures long life. The PTZ-35x140 MS and SR-35x140 MS operate between -32°C and +55°C. Both thermal imaging cameras have a built-in heater to defrost their protective window.

Different versions available
- SR-35x140 MS:
This is a fixed mount thermal imaging camera. Once installed, it is always surveying the same area.
- PTZ-35x140 MS:
The PTZ-35x140 MS can continuously rotate 360° horizontally and tilt +/- 60° vertically. This way the operator can scan an entire area and look wherever he wants.

Continuous zoom - Foveal View
The PTZ-35x140 MS and SR-35x140 MS feature a completely new concept in image presentation based on the foveal vision of the human eye. Foveal vision allows the operator to enjoy a wide angle view for situational awareness while maintaining a high resolution area in the center of the screen for object identification and tracking. The PTZ-35x140 MS and SR-35x140 MS accomplish this with two independent thermal cameras and a unique patented image processing technique that provides both the foveal imaging mode as well as a continuous zoom between the wide and narrow fields of view.

Fast, precision "Pan/Tilt" - PTZ-35x140 MS Only
Intuitive joystick operation allows the operator to see 360° horizontal and +/-60° vertically, offering superb situational awareness. No special training is required to use the PTZ-35x140 MS.

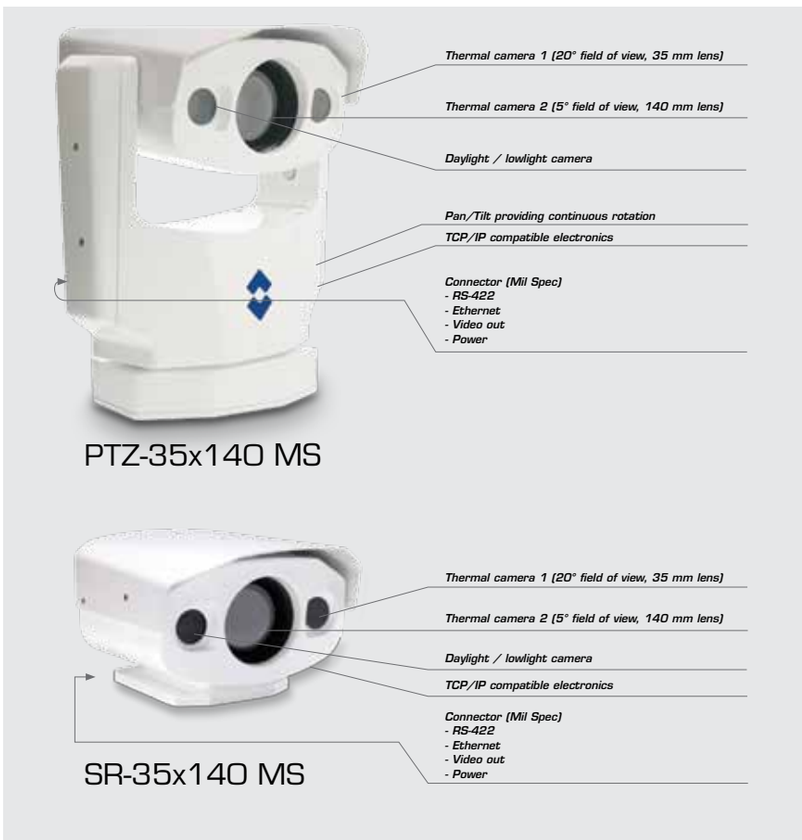
Radar Connection – "Slew to cue" - PTZ-35x140 MS Only
The PTZ-35x140 MS can be connected by the integrator to a radar system. If the radar detects an object, the PTZ-35x140 MS will automatically turn in the right direction and give you a visual image so that you can instantly see what the blip on the radar screen really means.

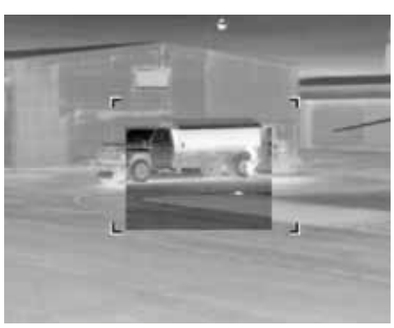
IP control
The PTZ-35x140 MS and SR-35x140 MS can be integrated in any existing TCP/IP network and controlled over a PC. No additional cables are required. Using this configuration, you can monitor all activity over the internet, even when you are thousands of kilometers away.

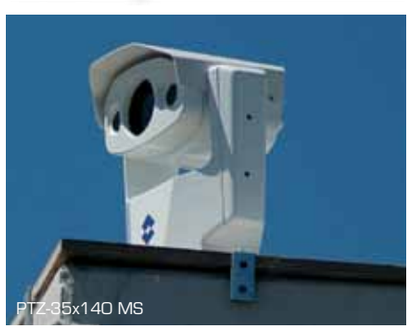
Serial control interface
Simply connect the PTZ-35x140 MS or SR-35x140 MS over RS-422 to a remote control panel. Pelco D commands are used for common Pan/Tilt/Zoom functions. A video cable can be connected to any existing multi-function display that accepts composite video.

Video Streaming
Multiple channels of streaming digital video are available in MPEG-4. Simultaneous digital and composite video output is possible.

FLIR Sensors Manager
Each PTZ/SR-35x140 MS camera comes with a single sensor copy of FLIR Sensors Manager. This intuitive software allows users to manage and control a PTZ/SR-35x140 MS camera in a TCP/IP network.


Thermal camera 1 (20° field of view, 35 mm lens)
Thermal camera 2 (5° field of view, 140 mm lens)
Daylight / lowlight camera
Pan/Tilt providing continuous rotation
TCP/IP compatible electronics
Connector (Mil Spec)
- RS-422
- Ethernet
- Video out
- Power
PTZ-35x140 MS
Thermal camera 1 (20° field of view, 35 mm lens)
Thermal camera 2 (5° field of view, 140 mm lens)
Daylight / lowlight camera
TCP/IP compatible electronics
Connector (Mil Spec)
- RS-422
- Ethernet
- Video out
- Power
SR-35x140 MS





Thanks to 2 thermal imaging cameras the PTZ/SR-35x140 MS contain a continuous optical zoom on the thermal image.

FLIR NETWORKED SYSTEMS

Your partner for intelligent TCP/IP sensor networks

Modern security systems are becoming more and more complex. A security network consists of various types of sensors that need to work together in order to offer maximum performance. Radar, perimeter and ground sensors, CCTV cameras, thermal imaging cameras and other sensors need to be geo-referenced and interconnected in "slew to cue" configurations.

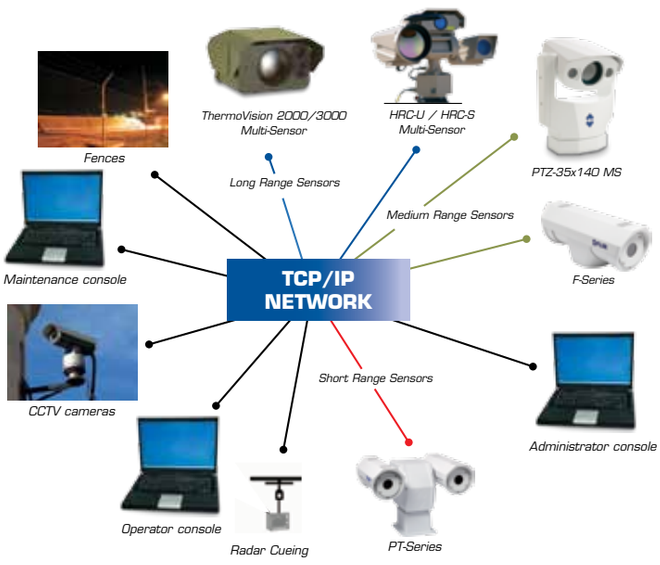
FLIR Systems thermal imaging cameras can be configured for standalone use. But they are also "intelligent sensors". They can be easily deployed as plug & play elements in a TCP/IP network.

FLIR Networked Systems
The mission of FLIR Networked Systems is to support systems integrators that want to include FLIR Systems thermal imaging cameras and third party sensors in modern security networks.

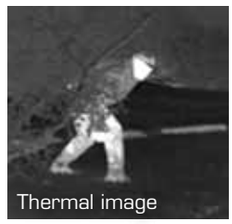
FLIR Networked Systems is a group of highly skilled professionals that can help systems integrators, product manufacturers, government agencies and commercial end users to focus on their core business activities and quickly respond to changing market conditions.

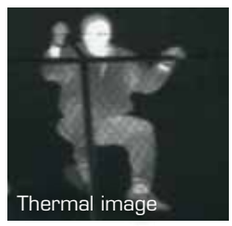
Your experienced partner
FLIR Networked Systems delivers components and services for critical security and surveillance applications to companies around the world. We have built stable relationships with commercial and technological partners and work closely together with the engineering teams of many systems integrators and product manufacturers.

Basing their solutions on our tools, solution providers can reduce software development costs and integration risks.



FLIR Networked Systems offers tools and expertise to help systems integrators deploy professional sensor networks.





FLIR Networked Systems offers a wide variety of products to help you set up a professional security network:

Software

Middleware / OEM

Our software agents or servers turn each sensor into a plug & play manageable network object in TCP/IP networks. The server resides in each of the sensors in the network making it a network manageable node. The server can run in MiniServers, on FPGAs or in rack-mount industrial PCs. Drivers are available for devices such as: thermal imaging and CCTV Cameras, Radars, Alarm Contacts, Fence & Ground Sensors, Vehicles, UAV or Meteo Stations.

Client Applications

FLIR Networked Systems also offers client applications that make our sensor servers become visible and easy-to-use by operators. These are all based on FLIR Networked Systems' developers tools.

- FLIR Sensors Manager
- Console Plug-ins: (VMD, Target Acquisition and Tracking, Video Filters and Electronic Stabilization, Advanced Cartography, Radar Tracks Display)
- Software based VideoWall

Hardware

FLIR Networked Systems offers specific hardware appliances such as rugged MiniServers, Storage Servers (nDVR), Video Processing Units (nVPU), PC based servers and OEM boards for embedded applications.

Developers Tools

These allow developers to build their own Command and Control applications to manage and control sensors. Our toolkits include libraries for communications, image processing and video display or moving maps…

SDK - "easy-to-integrate"

SW developers can use our SDK and technical support to easily develop their own command & control or sensor and video management applications.

FLIR Maps

This control offers a moving map display to be integrated in high level graphical user interface software applications.

FLIR Video Player

ActiveX control that provides a set of functions to display and process video from different sources. The FLIR Video Player provides video functions to be integrated in high level software applications.

OEM Licenses

nDVR and Video Analysis Tools are available for OEM customers. Yearly subscriptions for technical support including generation of licenses and updates are available .

Professional Services

Our past experience as systems integrators and with the devices allows us to help you minimize your network challenges and reduce your operating costs. We offer consulting, training and support services based on this know-how in the following fields:

- System Architecture Design and Networking
- Training & On Site Support and New Products

FLIR Networked Systems: serving different types of customers

End Users:

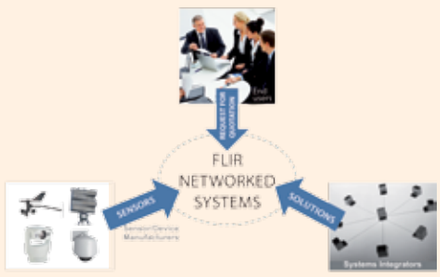
They demand open, flexible and scalable architectures that allow them to manage their security network and use multiple vendors.

Systems Integrators:

Want to integrate and deploy complex systems and need "easy-to-integrate" sensors and low-level tools (SDK) that can make their job easier, reducing risks, schedules and software development costs.

Sensors/Device Manufacturers:

FLIR Networked Systems can help them with the adoption of evolving standards and some of the other market challenges they face in bringing competitive devices to market.



SOFTWARE

Turning tools into solutions

At FLIR Systems, we recognize that our job is to go beyond just producing the best possible thermal imaging cameras. We are committed to enabling all users of our thermal imaging camera systems to work more efficiently and productively by providing them with the most professional camera-software combination.

Our team of committed specialists are constantly developing new, better and more user-friendly software packages to satisfy the most demanding security professionals.

FLIR Sensors Manager

Software to manage and control FLIR Systems thermal imaging cameras for security and surveillance applications.

FLIR Sensors Manager offers powerful and efficient management capabilities for any security installation with FLIR Systems thermal imaging cameras. FLIR Sensors Manager allows to automatically locate FLIR Systems thermal imaging cameras in the network and to easily control them.

Easy to use
FLIR Sensors Manager is a commercial “Out of the Box” software. Fully designed and supported by FLIR Systems, this application guaranties an intuitive and simple user experience. Just install the software and you will be ready to use it immediately. You can even tailor the layout to your own needs.

Connect a large number of sensors
Both the Basic and the Pro versions of FLIR Sensors Manager allow multiple users to share monitoring and control of up to four FLIR Systems thermal imaging cameras.

Different license packages to manage more than one camera are available. Additional sensor licenses can be added to manage up to 50 sensors from a single workstation.

Control a wide variety of sensors
FLIR Sensors Manager not only works together with FLIR Systems thermal imaging cameras. Using Nexus technology, it can also be used to control a wide variety of other sensors like radars, ground sensors and many others and to make these sensors interact with FLIR Systems thermal imaging cameras in so called “slew-to-cue” configurations.

Support for multiple languages
FLIR Sensors Manager can be configured to work in different languages, including English, French, German, Italian, Spanish, Chinese, Japanese, Russian, Arabic, Portuguese and Polish.

Different versions available
FLIR Sensors Manager is available in two different versions: Basic and Pro. Depending on your exact needs and your security network, you can choose the version that best fits your system’s requirements. A free demo version is available and can be downloaded from our website.

BASIC:
The Basic version of FLIR Sensors Manager allows to:

- Discover sensors in the network
- Command and control of up to four networked sensors: focus, pan/tilt, zoom…
- Display network video
- Define presets
- Manage scan lists
- Create panoramas
- Configure user profiles (toolbars, layout, etc)
- Show thermal images on multiple monitors
- Capture images
- Geo Mapping

PRO:
The Pro version of FLIR Sensors Manager contains all the features that are incorporated in the Basic version, plus a number of useful modes that will help you make the most out of your security network.

Video analytics
Allows to perform video analytics within FLIR Sensors Manager. It includes:

- Video Motion Detection: FLIR's pro–prietary algorithm will work on thermal or visible video in the most harsh environments.
- Target detection with alarms based on spatial rules like trip wires crossing or areas triggered by enter, exit or both events.
- Software based video-tracking of moving objects for control of PTZ sensors.

E-stab
Provides a steady image. Can be extremely useful when cameras are installed on high poles where they can be affected by wind or vibration.

Radar Cueing and radar tracks display
Allows display of real-time position and classification information of radar targets (ID, course, speed, lat/lon, classification, ...) coming from Nexus enabled radars. Allows users to command cameras in advanced radar slave modes (ARPA tracking).

Video wall display
Allows fully configurable video mosaic layouts, supporting both network and analog frame grabber sources.

With FLIR Sensors Manager installing and managing FLIR Systems thermal imaging cameras and other Nexus sensors in a network becomes extremely easy.

The Pro Version of FLIR Sensors Manager allows for a wide range of video analytics.

Geo-mapping allows to geo-calibrate a map so that any geo-referenced Nexus sensor can be managed and displayed on it.

FLIR Systems Sensors Manager Demo, Basic and Pro: overview

Features	Demo	Basic	Pro
Discover sensors in the network	•	•	•
Point-to-point sensor control: focus, pan/tilt, zoom,...	•	•	•
Display network video	•	•	•
Define presets	•	•	•
Manage scan lists	•	•	•
Create panoramas	•	•	•
Configure user profiles (toolbars, layout, etc)	•	•	•
Show thermal images on multiple monitors	•	•	•
Capture images	•	•	•
Geo-mapping		•	•
Video analytics			•
E-stab			•
Radar cueing / radar tracks display			•
Video walls			•
Number of managed sensors	1	4	4
Licenses for more sensors available	•	•	•

ITC

FLIR Infrared Training Center

The Infrared Training Center (ITC) offers the world's leading infrared training.

Although all our cameras are designed for easy installation and operation, there is a lot more to thermal imaging than just knowing how to handle the camera. As the leading company for thermal imaging technology, we like to share our knowledge with our customers and other interested parties.

We therefore organize regular courses and seminars. We also organize in-company training on request, so that you, or your staff, can gain familiarity with thermal imaging and its applications.

The ITC not only welcomes FLIR Systems customers but also users of other brands of cameras. In fact, anyone who wants to learn more about thermal imaging for any applications, before deciding to purchase a camera, is also invited.

The mission of the ITC is to make our customers and partners successful by enhancing their knowledge of IR technology, thermal imaging products, and relevant security and surveillance applications. The ITC offers a portfolio of courses that presents the right mix of theoretical and practical content to help professionals quickly apply thermal imaging technology to real life applications.

All courses are a perfect mix between theoretical fundamentals and practical excercises. For our customers, this means that attending one of the ITC's courses will give you a real hands-on learning experience.

Follow one of our courses and become a thermal imaging expert.
www.flir.com/thg/itc

Each ITC course is a pefect combination of theoretical fundamentals and practical excercises. It guarantees participants a real hands-on learning experience.

AFTER SALES

FLIR After Sales

At FLIR Systems, building a relationship with a customer takes more than just selling a thermal imaging camera. After the camera has been delivered, FLIR Systems is there to help meet your needs.

Once purchased, thermal imaging camera are vital pieces of equipment. The safety and security of assets and people depends on it. To keep them running at all times, we operate a worldwide service network.
In APAC we have subsidiaries in Hong Kong, China, India, Japan, Korea and Australia.

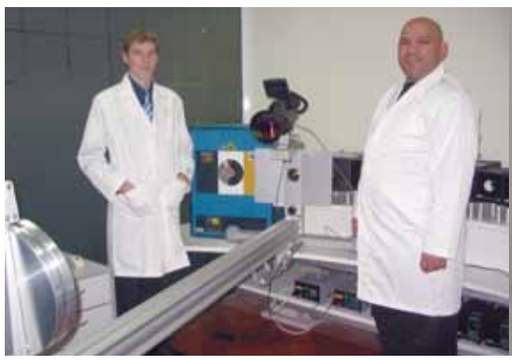
If there should be a problem with one of our camera systems, these local service centers have all the know-how and equipment to solve it within the shortest possible time. Local camera service gives you the assurance that your system will be ready for use again within an extremely short timeframe.

Buying a thermal imaging camera is a long-term investment. You need a reliable supplier who can provide you with support over a long period of time.

Our service personnel regularly follows training programs at our production facilities in Sweden or the USA. Not only to learn about the technical aspects of the products, but also to familiarize themselves with your individual customer requirements and the latest applications.

Different types of maintenance contracts can be offered to make sure that, whatever happens, your thermal imaging camera is always available for use.

CUSTOMER CARE is not just a slogan.
We write it in capital letters at FLIR.
www.flir.com/thg/service



SR-SERIES

Technical specifications

SR-Series: general specifications

IMAGING PERFORMANCE	
Detector type	Focal Plane Array (FPA), uncooled Vanadium Oxide microbolometer
Spectral range	<50 mk @ f/ 1.0
Full frame rates	25Hz (PAL) / 30Hz (NTSC)
Exportable Frame Rate	8.3Hz (PAL)/ 7.5Hz (NTSC)
Focus	Focus free, athermal lens
Image processing	Automatic Gain Control (AGC), Digital Detail Enhancement (DDE)

SYSTEM FEATURES	
Automatic heater	Clears ice from windows

IMAGE PRESENTATION	
Video output	NTSC or PAL composite video
Connector types	BNC (1) provides video output

POWER	
Requirements	14-32 V DC or 18-27 V AC
Consumption	Nominal: 3 W at 24 V DC / 5 VA at 24 V AC Peak at 24 V DC: 10 W for SR-112, SR-117, SR-124, SR-324, SR-334, SR-348, SR-645 6 W for SR-313, SR-618 8 W for SR-309, SR-612, SR-625 25 W for SR-304, SR-606 Peak at 24 V AC: 21 VA for SR-112, SR-117, SR-124, SR-324, SR-334, SR-348, SR-645 11 VA for SR-313, SR-618, 17 VA for SR-309, SR-612, SR-625 48 VA for SR-304, SR-606

ENVIRONMENTAL SPECIFICATION	
Operating temperature range	-40°C to +55°C
Storage temperature range	-50°C to +85°C
Encapsulation	IP66
Shock	IEC 60068-2-27
Vibration	Mil-Std-810F

PHYSICAL CHARACTERISTICS	
Camera Weight	2.1 kg (all except SR-304, SR-606) 2.6 kg (SR-304, SR-606)
Camera Size (L x W x H)	267 mm x 127 mm x 145 mm
Camera Size (L x W x H) SR-304, SR-606	361 mm x 127 mm x 145 mm
Shipping weight (camera + packaging)	5.3 kg
Shipping size (camera + packaging) (L x W x H)	496 mm x 343 mm x 331 mm

INTERFACES	
RS-422	Yes
RS-232	Yes

STANDARD PACKAGE
Thermal imaging camera, operator manual

SR-Series: version specific specifications

SENSOR RESOLUTION	160 X 120	320 X 240	620 X 480
Name/Focal length/ Field of view	SR-124: 9 mm lens – FOV: 24°(H) x 20°(V) SR-117: 13 mm lens – FOV: 17°(H) x 14°(V) SR-112: 19 mm lens – FOV: 12°(H) x 10°(V)	SR-348: 9 mm lens - FOV: 48°(H) x 39°(V) SR-334: 13 mm lens - FOV: 34°(H) x 28°(V) SR-324: 19 mm lens - FOV: 24°(H) x 19°(V) SR-313: 35 mm lens - FOV: 13°(H) x 10°(V) SR-309: 50 mm lens - FOV: 9°(H) x 7°(V) SR-304: 100 mm lens - FOV: 4.6°(H) x 3.7°(V)	SR-645: 13mm lens - FOV: 45°(H) x 37°(V) SR-625: 25mm lens - FOV: 25°(H) x 20°(V) SR-618: 35mm lens - FOV: 18°(H) x 14°(V) SR-612: 50mm lens - FOV: 12°(H) x 10°(V) SR-606: 100mm lens - FOV: 6.2°(H) x 5°(V)
Electronic zoom	2x	2x and 4x	2x and 4x

Specifications are subject to change without notice.
Sizes and weights are indicative.

F-SERIES

Technical specifications

F-Series: general specifications

IMAGING PERFORMANCE	
Detector type	Focal Plane Array (FPA), uncooled Vanadium Oxide (Vox) microbolometer
Spectral range	<50mk @ f/1.0
Full Frame Rates	25Hz(PAL)/ 30Hz (NTSC)
Exportable Frame Rates	8.3Hz (PAL)/ 7.5Hz (NTSC)
Focus	Focus free, athermal lens
Image processing	Automatic Gain Control (AGC), Digital Detail Enhancement (DDE)

SYSTEM FEATURES	
Automatic heater	Clears ice from windows

IMAGE PRESENTATION	
Video output	PAL or NTSC
Video over Ethernet	Two independent channels of streaming MPEG-4, H.264, or M-JPEG

POWER*	
Requirements	24 VAC (21-30 VAC) 24 VDC (21-30 VDC)
Consumption	24 VAC: 51 VA max w/heater 24 VDC: 46 W max w/heater

ENVIRONMENTAL SPECIFICATION	
Operating temperature range	-40°C to +55°C
Storage temperature range	-50ºC to +85ºC
Encapsulation	IP66
Shock	IEC 60068-2-27
Vibration	Mil-Std-810F

PHYSICAL CHARACTERISTICS	
Camera Weight	4.3 kg
Camera Size (L x W x H)	460 mm × 140 mm × 160 mm
Shipping weight (camera + packaging)	5.6 kg
Shipping size (camera + packaging) (L x W x H)	508 mm x 203 mm x 229 mm

INTERFACES	
TCP/IP	Yes
RS-422	Yes
RS-485	Yes
RS-232	Yes
Pelco D	Yes
Bosch	Yes

STANDARD PACKAGE
Thermal imaging camera, operator manual

**Please consult product installation and operation guides for details of system power requirements*

F-Series: version specific specifications

SENSOR RESOLUTION	160 X 120	320 X 240	640 X 480
Name/Focal length/ Field of view	F-124: 9 mm lens – FOV: 24°(H) × 20°(V) F-117: 13 mm lens – FOV: 17°(H) × 14°(V) F-112: 19 mm lens – FOV: 12°(H) × 10°(V)	F-348: 9 mm lens - FOV: 48°(H) x 39°(V) F-334: 13 mm lens - FOV: 34°(H) x 28°(V) F-324: 19 mm lens - FOV: 24°(H) x 19°(V) F-313: 35 mm lens - FOV: 13°(H) x 10°(V) F-307: 65 mm lens - FOV: 7°(H) x 5°(V) F-304: 100 mm lens - FOV: 4.6°(H) x 3.7°(V)	F-645: 13 mm lens – FOV: 45°(H) × 37° (V) F-625: 25 mm lens – FOV: 25° (H) × 20°(V) F-618: 35mm lens - FOV: 18°(H) x 14°(V) F-612: 50mm lens - FOV: 12° (H) x 10° (V) F-606: 100mm lens - FOV: 6.2° (H) x 5° (V)
Electronic zoom	2x	2x and 4x	2x and 4x

Specifications are subject to change without notice.
Sizes and weights are indicative.

PT-SERIES

Technical specifications

PT-Series: general specifications

IMAGING PERFORMANCE	
Thermal:	
Detector type	Focal Plane Array (FPA), uncooled Vanadium Oxide microbolometer
Spectral range	<50mk @ f/1.0
Full Frame Rates	25Hz (PAL)/ 30Hz (NTSC)
Exportable Frame Rates	8.3 Hz (PAL)/ 7.5 Hz (NTSC)
Focus	Focus free, athermal lens
Image processing	Automatic Gain Control (AGC), Digital Detail Enhancement (DDE)
Visual:	
Built-in digital video	1/4" Exview HAD CCD
Effective pixels	380.000
Standard lens performance	FOV: 57.8° (H) to 1.7° (H) f=3.4mm (wide) to 122.4 mm (tele), F1.6 to F4.5
Optical zoom	36x
Electronic zoom	12x

PAN- TILT	
Az Range; Az velocity	360° continuous, 0.1 to 60°/sec max.
El Range; El velocity	+/- 90°, 0.1 to 30°/sec. Max.
Programmable presets	128

SYSTEM FEATURES	
Automatic heater	Clears ice from windows

IMAGE PRESENTATION	
Video output	PAL thermal and visible - NTSC thermal and visible
Video over Ethernet	Two independent channels for each camera (4 total) of streaming MPEG-4, H.264, or M-JPEG

POWER*	
Requirements	24 VAC (21-30 VAC) 24 VDC (21-30 VDC)
Consumption	24 VAC: 215 VA max w/heater 24 VDC: 195 W max w/heater

ENVIRONMENTAL SPECIFICATION	
Operating temperature range	-40°C to +55°C
Storage temperature range	-50ºC to +85ºC
Encapsulation	IP66
Shock	IEC 60068-2-27
Vibration	Mil-Std-810F

PHYSICAL CHARACTERISTICS	
Camera Weight	16.4 kg
Camera Size (L x W x H)	348 mm × 467 mm × 326 mm
Shipping weight (camera + packaging)	20.5 kg
Shipping size (camera + packaging) (L x W x H)	599 mm x 542 mm x 340 mm

INTERFACES	
TCP/IP	Yes
RS-485	Yes
RS-422	Yes
RS-232	Yes
Pelco D	Yes
Bosch	Yes

STANDARD PACKAGE
Thermal imaging camera, operator manual

**Please consult product installation and operation guides for details of system power requirements*

PT-Series: version specific specifications

SENSOR RESOLUTION	160 X 120	320 X 240	640 X 480
Name/Focal length/ Field of view	PT-124: 9 mm lens – FOV: 24°(H) × 20°(V) PT-117: 13 mm lens – FOV: 17°(H) × 14°(V) PT-112: 19 mm lens – FOV: 12°(H) × 10°(V)	PT-348: 9 mm lens - FOV: 48°(H) x 39°(V) PT-334: 13 mm lens - FOV: 34°(H) x 28°(V) PT-324: 19 mm lens - FOV: 24°(H) x 19°(V) PT-313: 35 mm lens - FOV: 13°(H) x 10°(V) PT-307: 65 mm lens - FOV: 7°(H) x 5°(V) PT-304: 100 mm lens - FOV: 4.6°(H) x 3.7°(V)	PT-645: 13 mm lens – FOV: 45°(H) × 37°(V) PT-625: 25 mm lens – FOV: 25°(H) × 20°(V) PT-618: 35mm lens- FOV: 18°(H) x 14°(V) PT-612: 50mm lens- FOV: 12°(H) x 10°(V) PT-606: 100mm lens- FOV: 6.2°(H) x 5°(V)
Electronic zoom	2x	2x and 4x	2x and 4x

Specifications are subject to change without notice.
Sizes and weights are indicative.

D-SERIES: FOR INDOOR APPLICATIONS

Technical specifications

Indoor D-Series: general specifications

IMAGING PERFORMANCE	
Detector type	Focal Plane Array (FPA), uncooled Vanadium Oxide (Vox) microbolometer
Spectral range	<50mk @ f/1.0
Full Frame Rates	25Hz (PAL)/ 30Hz (NTSC)
Exportable Frame Rates	8.3Hz (PAL)/ 7.5Hz (NTSC)
Focus	Focus free, athermal lens
Image processing	Automatic Gain Control (AGC), Digital Detail Enhancement (DDE)

PAN- TILT	
Az Range; Az velocity	360° continuous; 0.5°/sec to 100°/sec
El Range; El velocity	0° to 90° 0.5°/sec to 100°/sec
Programmable presets	32
Autoscan	1 path: scans linearly between 2 user-defined points
Pattern	1 route, up to 200 instructions
Autoflip	Enabled

SYSTEM FEATURES	
Pelco D compliance	Yes

IMAGE PRESENTATION	
Video output	PAL or NTSC
Connector types	RS-485, Pelco D

POWER	
Requirements	24 V AC +/- 25%
Consumption	< 20 W

ENVIRONMENTAL SPECIFICATION	
Operating temperature range	-10°C to +50°C
Humidity	< 90% RH, non-condensing. Indoor use only. Must be protected from direct or indirect precipitation or water spray

PHYSICAL CHARACTERISTICS	
Camera Weight	Pendant: 1.6 kg - ceiling mount configuration 3.0 kg
Camera Size (L x W x H)	Pendant: 200 mm H, 152 mm Ø Ceiling trim ring 279.4 mm Ø
Shipping weight (camera + packaging)	5.5 kg
Shipping size (camera + packaging) (L x W x H)	38 cm x 38 cm x 48 cm

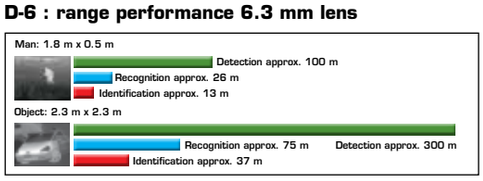
INTERFACES	
RS-485	Yes
Pelco D	Yes

STANDARD PACKAGE
Thermal imaging camera, complete ceiling mount kit (trim ring and back-housing) user manual

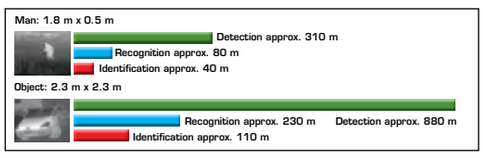
Indoor D-Series: version specific specifications

SENSOR RESOLUTION	160 X 120	320 X 240
Name/Focal length/ Field of view	D-6: 6.3 mm lens - FOV: 52° (H) x 42° (V)	D-19: 19 mm lens - FOV: 36° (H) x 27° (V)

D-6 : range performance 6.3 mm lens


Man: 1.8 m x 0.5 m
Detection approx. 100 m
Recognition approx. 26 m
Identification approx. 13 m
Object: 2.3 m x 2.3 m
Recognition approx. 75 m
Detection approx. 300 m
Identification approx. 37 m

D-19 : range performance 19 mm lens


Man: 1.8 m x 0.5 m
Detection approx. 310 m
Recognition approx. 80 m
Identification approx. 40 m
Object: 2.3 m x 2.3 m
Recognition approx. 230 m
Detection approx. 880 m
Identification approx. 110 m

Actual range may vary depending on camera set-up, environmental conditions, user experience and type of monitor or display used.

Assumptions:
50 % probability of achieving objective at specified distance given 2°C temperature difference and 0.85 / km atmospheric attenuation factor.

Specifications are subject to change without notice.
Sizes and weights are indicative.

D-SERIES: FOR OUTDOOR APPLICATIONS

Technical specifications

Outdoor D-Series

IMAGING PERFORMANCE	
Thermal:	
Detector type	Focal Plane Array (FPA), uncooled microbolometer
Number of pixels	320 x 240
Spectral range	7.5 to 13µm
Name/Focal length/ Field of view	D-348: 9 mm lens - FOV: 48°(H) x 39°(V) D-334: 13 mm lens - FOV: 34°(H) x 28°(V) D-324: 19 mm lens - FOV: 24°(H) x 19°(V) D-313: 35 mm lens - FOV: 13°(H) x 10°(V)
Thermal sensitivity	<50mk @ f/1.0
Full Frame Rates	25Hz (PAL)/ 30Hz (NTSC)
Exportable Frame Rates	8.3Hz (PAL)/ 7.5Hz (NTSC)
Focus	Focus free, athermal lens
Electronic zoom	2x and 4x
Image processing	Automatic Gain Control (AGC), Digital Detail Enhancement (DDE)
Visual:	
Built-in digital video	1/4" Exview HAD CCD
Effective pixels	380.000
Standard lens performance	FOV: 57.8° (H) to 1.7° (H) f=3.4mm (wide) to 122.4 mm (tele), F1.6 to F4.5
Optical zoom	36x
Electronic zoom	12x

PAN- TILT	
Az Range; Az velocity	360° continuous, 0.5 to 60°/sec max.
El Range; El velocity	+45°, to -185°/sec, 0.5 to 60°/sec max.
Programmable presets	128

SYSTEM FEATURES	
Automatic heater	Clears ice from windows

IMAGE PRESENTATION	
Video output	PAL thermal and visible - NTSC thermal and visible
Video over Ethernet	Two independent channels for each camera (4 total) of streaming MPEG-4, H.264, or M-JPEG

POWER	
Requirements	24 VAC (20-30 VAC) 24 VDC (21-30 VDC)
Consumption	24 VAC: 40 VA nominal 65 VA max w/heater 24 VDC: 30 W nominal 50 W max w/heater

ENVIRONMENTAL SPECIFICATION	
Operating temperature range	-25°C to +55°C
Storage temperature range	-50ºC to +85ºC
Encapsulation	IP66
Vibration	Mil-Std-810F

PHYSICAL CHARACTERISTICS	
Camera Weight	10.5 kg
Camera Size (L x W x H)	471 mm × 199 mm × 556 mm
Shipping weight (camera + packaging)	16.4 kg
Shipping size (camera + packaging) (L x W x H)	762 mm x 585 mm x 330 mm

INTERFACES	
TCP/IP	Yes
RS-485	Yes
RS-422	Yes
RS-232	Yes
Pelco D	Yes
Bosch	Yes

STANDARD PACKAGE
Thermal imaging camera, operator manual

Specifications are subject to change without notice.
Sizes and weights are indicative.

PTZ/SR-35X140 MS

Technical specifications

IMAGING PERFORMANCE	
Thermal:	
Detector type	Focal Plane Array (FPA), uncooled Vanadium Oxide microbolometer
Number of pixels	320 x 240 pixels
Spectral range	7.5 to 13µm
Number of fields of view	Two thermal imaging cameras with foveally merged video
Field of view camera / lens 1	20° (H) x 15° (V) with 35 mm lens (RS170A) 20° (H) x 16° (V) with 35 mm lens (CCIR)
Field of view camera / lens 2	5° (H) x 3.75° (V) with 140 mm lens (RS170A) 5° (H) x 4.0° (V) with 140 mm lens (CCIR)
Full Frame Rates	25Hz (PAL)/ 30Hz (NTSC)
Exportable Frame Rate	8.3Hz (PAL) / 7.5Hz (NTSC)
Focus	Automatic or Manual
Continuous optical zoom	Yes
Electronic zoom	Foveal presentation: 20° to 2° HFOV
Image processing	Digital Detail Enhancement (DDE)
Visual:	
Built-in digital video	Sony FCB EX-980S 26x High Telephoto Zoom Color Block Camera (NTSC) Sony FCB EX-980SP 26x High Telephoto Zoom Color Block Camera (PAL)
Effective pixels	Approx. 680,000 pixels (NTSC) Approx. 800,000 pixels (PAL)
Standard lens performance	26x Zoom, f=3.5mm (wide) to 91.0 mm (tele), F1.6 to F3.8
Optical zoom	26x tied to thermal zoom
Electronic zoom	up to 12 x

PAN- TILT (PTZ-35X140 MS ONLY)	
Az Range; Az velocity	360° continuous, 1-120° /sec max.
El Range; El velocity	+/- 60°, 120° max.
Slew Rate	Speed tied to zoom.
Parking Position	Yes

SYSTEM FEATURES	
Automatic heater	Clears ice from windows and the from the pan/tilt mechanism
Built-in Test (BIT)	Intelligent self diagnostics tests vital functions

IMAGE PRESENTATION	
Video output	PAL thermal and visible - NTSC thermal and visible
Connector types	BNC (1) provides active sensor video output (merged thermal or visible) RJ45 for network connectivity provided on break-out cable
Video over Ethernet	Streaming video via multicast MPEG4 Simultaneous WFOV IR, NFOV IR and daylight TV

Specifications are subject to change without notice.
Sizes and weights are indicative.

POWER	
Requirements	24 V DC or 24V AC (+/-10%)
Consumption	PTZ-35x140 MS: < 50 W nominal 130 W max. 270 W with heaters SR-35x140 MS: < 21 W nominal; 25 W max. <100 W with heaters

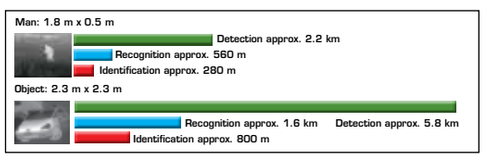
ENVIRONMENTAL SPECIFICATION	
Operating temperature range	-32°C to +55°C
Storage temperature range	-50°C to +85°C
Sand/dust	Mil-Std-810E
Encapsulation	IP66
Vibration	Mil-Std-810E

PHYSICAL CHARACTERISTICS	
Camera Weight	20.4 kg
Camera Size (L x W x H)	38.1 cm diameter x 58.5 cm height - swept volume
Shipping weight (camera + packaging)	32 kg
Shipping size (camera + packaging) (L x W x H)	85 cm x 59 cm x 41 cm

INTERFACES	
TCP/IP	Camera command and control
RS-422	Yes
Pelco D	Yes
Bosch	Yes

STANDARD PACKAGE
Pan/tilt head with integrated thermal imagers and DLTV camera break-out cable with standard mating connectors. Operator manual

PTZ-35x140 MS / SR-35x140 MS: range performance 140 mm lens


Man: 1.8 m x 0.5 m
Detection approx. 2.2 km
Recognition approx. 560 m
Identification approx. 280 m
Object: 2.3 m x 2.3 m
Recognition approx. 1.6 km
Detection approx. 5.8 km
Identification approx. 800 m

Actual range may vary depending on camera set-up, environmental conditions, user experience and type of monitor or display used.

Assumptions:
50 % probability of achieving objective at specified distance given 2°C temperature difference and 0.85 / km atmospheric attenuation factor.

ACCESSORIES

SR-Series

Power supply
Power supply to power an SR-Series thermal imaging camera.

Hard transport case for SR-Series thermal imaging camera
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

F-Series

F-Series pedestal mount
Mount to install an F-Series network-ready fixed mount thermal imaging camera. Typically used on a flat horizontal surface such as a wall or the top of a pole.

F-Series wall mount
Mount to install an F-Series network-ready fixed mount thermal imaging camera against a wall.

F-Series pole mount adapter
Can be used to mount an F-Series network-ready thermal imaging camera against a new or existing pole.

F-Series power supply
Power supply to power an F-Series network-ready thermal imaging camera.

Hard transport case for F-Series thermal imaging camera
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

D-Series

D-Series corner mount
Can be used to install a D-Series network-ready Multi-Sensor in the corner of a building.

D-Series power supply
Power supply to power a D-Series network-ready thermal imaging camera.

Hard transport case for D-Series thermal imaging camera
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

Nexus Console Joystick
Joystick to control the D-Series.

ACCESSORIES

PT-Series

PT-Series wall mount
Can be used to mount a PT-Series network-ready Multi-Sensor against a wall.

PT-Series pole mount adapter
Adapts the PT-Series wall mount for installation on a pole.

PT-Series adapter plate
Can be used to mount a PT-Series network-ready Multi-Sensor to a wide variety of existing mounts.

PT-Series pedestal mount
Mount to install a PT-Series network-ready Multi-Sensor. Typically used on a flat horizontal surface such as a wall or the top of a pole.

PT-Series power supply
Power supply to power a PT-Series network-ready thermal imaging camera.

Hard transport case for PT-Series thermal imaging camera
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

Nexus Console Joystick
Joystick to control the PT-Series

SR/PTZ-35x140MS

Wheeled shipping case for the SR/PTZ-35x140MS (and breakout cable)
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

Wheeled shipping case for the SR/PTZ-35x140MS accessories (40' cable, power supply, laptop, etc)
Rugged, watertight plastic shipping case. Holds all items securely. The case can be locked with padlocks and features a breather valve to prevent pressure build-up in airplane cargo holds.

Cable (extension)
40" extension cable to connect the PTZ/SR-35x140 MS to the break-out box.

24VAC Power Supply
Power supply for the PTZ/SR-35x140 MS.

Nexus Console Joystick
Joystick to control the PTZ-35x140 MS.

RANGE PERFORMANCES

Range performances for SR-, F-, PT-, and outdoor D-Series with 320x240 pixels detector

Detection, Recognition, Identification of Human Target

9 mm lens	Detection approx. 205 m Recognition approx. 52 m Identification approx. 26 m
13 mm lens	Detection approx. 300 m Recognition approx. 74 m Identification approx. 37 m
19 mm lens	Detection approx. 450 m Recognition approx. 112 m Identification approx. 56 m
35 mm lens	Detection approx. 780 m Recognition approx. 190 m Identification approx. 97 m
65 mm lens	Detection approx. 1,450 m Recognition approx. 370 m Identification approx. 185 m
100 mm lens	Detection approx. 2,075 m Recognition approx. 540 m Identification approx. 270 m

Detection, Recognition, Identification of Vehicle with 2.3m critical dimension

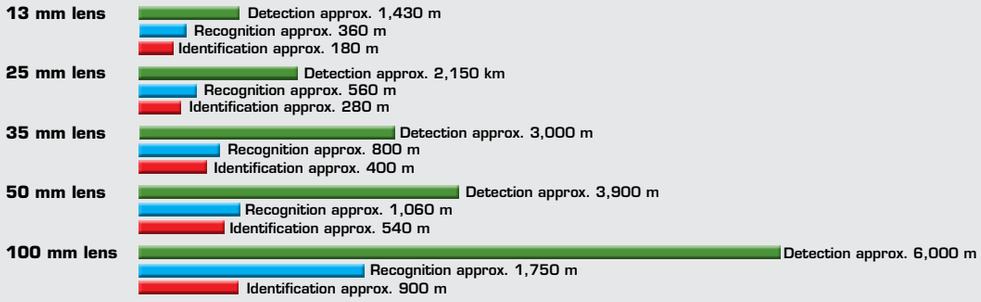
9 mm lens	Detection approx. 590 m Recognition approx. 150 m Identification approx. 74 m
13 mm lens	Detection approx. 840 m Recognition approx. 215 m Identification approx. 108 m
19 mm lens	Detection approx. 1,280 m Recognition approx. 330 m Identification approx. 165 m
35 mm lens	Detection approx. 2,150 m Recognition approx. 560 m Identification approx. 280 m
65 mm lens	Detection approx. 3,900 m Recognition approx. 1,040 m Identification approx. 530 m
100 mm lens	Detection approx. 5,300 m Recognition approx. 1,500 m Identification approx. 760 m

Range performances for SR-, F- and PT-Series with 640x480 pixels detector

Detection, Recognition, Identification of Human Target

13 mm lens	Detection approx. 500 m Recognition approx. 127 m Identification approx. 63 m
25 mm lens	Detection approx. 780 m Recognition approx. 190 m Identification approx. 97 m
35 mm lens	Detection approx. 1,140 m Recognition approx. 280 m Identification approx. 142 m
50 mm lens	Detection approx. 1,500 m Recognition approx. 380 m Identification approx. 190 m
100 mm lens	Detection approx. 2,450 m Recognition approx. 650 m Identification approx. 330 m

Detection, Recognition, Identification of Vehicle with 2.3m critical dimension



Actual range may vary depending on camera set-up, environmental conditions, user experience and type of monitor or display used.
Assumptions:
50 % probability of achieving objective at specified distance given 2°C temperature difference and 0.85 / km atmospheric attenuation factor.

Asia Pacific Headquarter
HONG KONG
FLIR Systems Co. Ltd.
Room 1613 – 16, Tower 2,
Grand Central Plaza,
No. 138 Shatin Rural Committee Road,
Shatin, New Territories, Hong Kong
Tel : +852 2792 8955
Fax : +852 2792 8952
E-mail : flir@flir.com.hk

CHINA
FLIR Systems (Shanghai) Co. Ltd. - Head Office
Tel : +86 21 5169 7628
Fax : +86 21 5466 0289
E-mail : info@flir.cn

JAPAN
FLIR Systems Japan K.K.
Tel : +81 3 6277 5681
Fax : +81 3 6277 5682
E-mail : info@flir.jp

KOREA
FLIR Systems Korea
Tel : +82 2565 2714
Fax : +82 2565 2718
E-mail : sales@flirkorea.com

TAIWAN
FLIR Systems Taiwan Representative Office
Tel : +886 2 2757 9662
Fax : +886 2 2757 6723
E-mail : flir@flir.com.hk

INDIA
FLIR Systems Representative Office in India
Tel : +91 11 4606 7100
Fax : +91 11 4606 7110
E-mail : flirindia@flir.com.hk

AUSTRALIA / NEW ZEALAND
FLIR Systems Australia Pty Ltd. - Head Office
Tel : +61 3 9550 2800
Fax : +61 3 9558 9853
E-mail : info@flir.com.au

101112 Security family brochure_en

Your local dealer: